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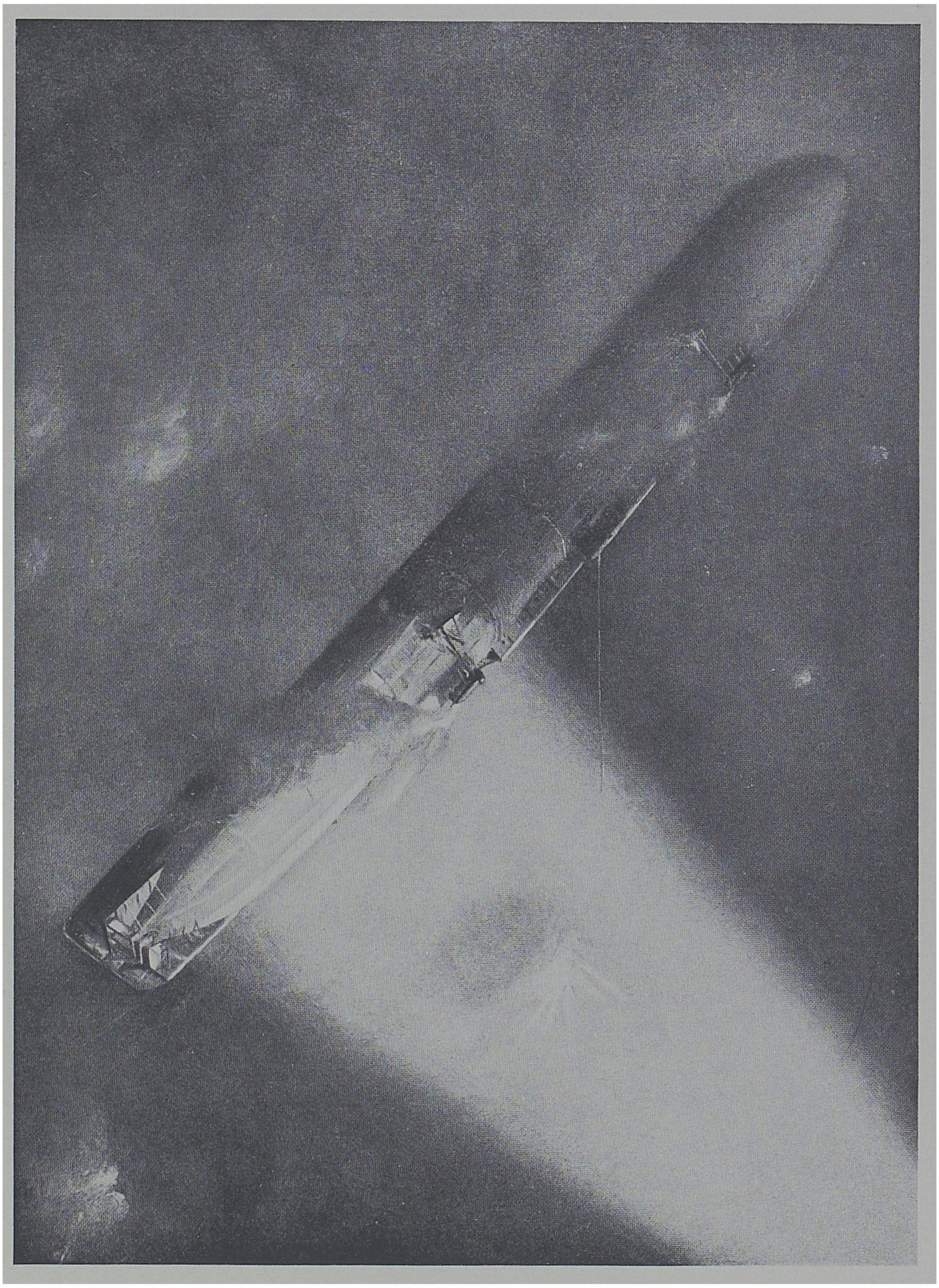


An Airship Fleeing Upward From an Attack by Anti-Aircraft Guns Below

THE FOURTH ARM OF THE SERVICE

IT is a curious circumstance that inventions, hailed as being among the greatest achievements recorded in the march of civilisation, often are devoted essentially to the maiming of humanity and the destruction of property. Such is the case with man's Conquest of the Air.

When, at last, man triumphed over Nature—at least to such a degree as to inspire the confidence of the world at large, and to bring aerial travel and transportation within range of realisation—what was the result? The discovery was developed in the interests of extermination and destruction, and from the view point of the community at large aerial travel is as remote as it was centuries ago.

But herein history is repeating itself. When the Montgolfiers succeeded in lifting themselves in the air by means of a vessel inflated with hot air, the new vehicle was hailed not so much as one possessed of commercial possibilities, but as an engine of war! When Count von Zeppelin in the face of disasters and failures, at last commanded the attention of the German Emperor, the latter regarded the Zeppelin not from the point of view of peace, but as a military weapon, and subsequent efforts were devoted to the perfection of the airship in this one direction. Other nations also, when they embarked on an identical line of development, considered the airship from a similar point of view—the military. A fact, hardly realised in this country, is that, despite the achievements which have been recorded by human endeavor in the field of aerial travel, the captive balloon has by no means been superseded, but still remains an invaluable adjunct to the fighting machine.

It may be taken for granted that enough has been read in the newspapers about Zeppelins to make it unnecessary to go into the subject. As a military weapon the aeroplane so far has proved superior to the dirigible balloon, the chief exploits of the latter being regarded in this country—whether rightly or wrongly—as outside the pale of civilised warfare.

For this reason, instead of tracing the development of the Zeppelin and Germany's other dirigibles, it will be more interesting to consider her principal aeroplane, the Taube. It is described in F. A. Talbot's book, "Aeroplanes and Dirigibles of War," an English work republished in this country by the J. B. Lippincott Company, and to which THE LOTUS is indebted for many of the features of this article.

First, however, it should be pointed out that the variety of aeroplanes is infinite and it was established early in the war that many of the models which had proved reliable and efficient under normal conditions were unsuited to military operations. Those of doubtful value were quickly eliminated, the result being that the machines which are now in use represent the survival of the fittest. Experience has also emphasized the necessity of reducing the number of types to an absolute minimum. The inconvenience and disadvantage arising from the utilisation of a wide variety of different types are manifold, the greatest being the necessity of carrying a varied assortment of spare parts, and confusion in the repair and overhauling shops.

German method was the first to grasp the significance of such drawbacks. Accordingly the Germans did not wait for war to carry aeroplane standardisation to a high degree of efficiency. France, however, soon appreciated the wisdom of the German practice, and within a short time after the outbreak of hostilities promptly ruled out certain types of machines which were regarded as unsuitable.

The German machine which is most familiar, by name, to the general public is the Taube. It is sometimes called the Etrich monoplane, from the circumstance that it was evolved by the Austrian engineer Igo Etrich in collaboration with his colleague Wels. These two experimenters had embarked on the study of dynamic flight contemporaneously with Maxim, Langley, Kress and other pioneers. It was not until 1908 however, that their first practical machine was completed. Its success was instantaneous. Some idea of the perfection of its design may be gathered from the fact that the machine of today is substantially identical with that used seven years ago. For the alterations suggested by experience have merely been modifications in minor details.

The design of this machine follows very closely the lines of a bird in flight—hence its colloquial description, "Taube," or "dove." Indeed the analogy to the bird is so close that the ribs of the frame resemble the feathers of a bird. The supporting plane is shaped in the manner of a bird's distended wing, and is tipped up at the rear ends to ensure stability. The tail also resembles that of a bird very closely.

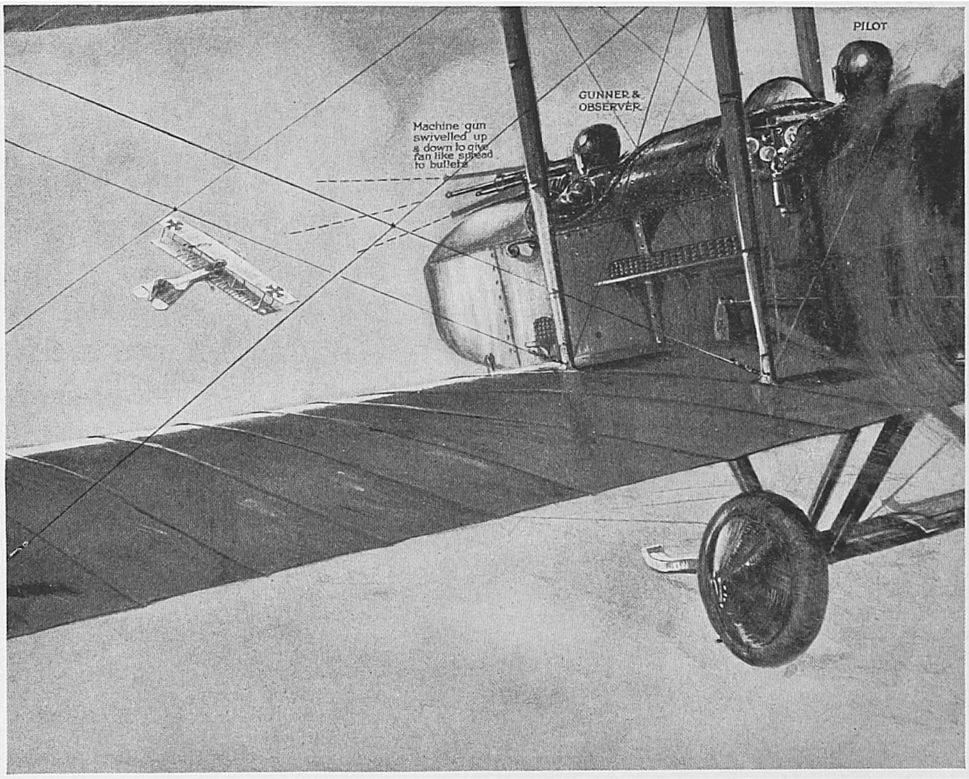
This aeroplane, especially the latest type, is very speedy, and it has proved extremely reliable. It is very sharp in turning and extremely sensitive to its rudder, which renders it a first-class craft for reconnoitring duty.

The "Taube," although invented by an Austrian, commanded attention in Germany for the reason that it indicated the first departure from the adherence to French designs which up to that time had been followed somewhat slavishly, owing to the absence of native initiative. The individuality of character revealed in the "Taube" appealed to the German instinct, with the result that the machine achieved a greater reputation than might have been the case had it been pitted against other types of essentially Teutonic origin.

The most successful of these endeavours is represented in the Taube-Rumpler aeroplane, which may be described as an improved edition of Etrich's original idea. As a matter of fact the modifications were of so slight, though important, a character that many machines generically described as "Taubes" are in reality Rumplers, but the difference is beyond detection by the ordinary and unpractised observer.

In the Rumpler machine the wings, like those of the Taube, assume broadly the form and shape of those of the pigeon or dove in flight. In the early models the wings were flexible, but in the present craft they are rigid, although fitted with tips or ailerons. The latest machines fitted with Mercédès motors have a fine turn of speed, possess an enhanced ascensional effort, and are far simpler to control.

Other German machines which are used in the military service are the Gotha and the Albatross. The former is a monoplane, and here again the influence of Etrich upon German aeroplane developments is strongly manifested, the shape of the bird's wing being retained. The Albatross is a biplane, but this craft has proved to be somewhat slow and may be said to be confined to what might be described as the heavier aerial military duties, where great endurance and reliability are essential.


PILOT
GUNNER & OBSERVER
Machine gun swivelled up & down to give fan like spread to bullets

A Biplane Attacking an Enemy

There is one point in which Germany has excelled. Wood is not employed in the construction of these heavier-than-air craft. Steel and the lighter tough alloys are exclusively used. In this way the minimum of weight consistent with the maximum of strength policy is carried out. Moreover the manufacture of component parts is facilitated and accelerated to a remarkable degree by the use of metal, while the tasks of fitting and repairing are notably expedited by the practice of standardisation.

Upon the outbreak of hostilities the French possessed an enormous number and variety of aeroplanes and this aerial fleet had been brought to a high standard of organisation. The aerial fleet is sub-divided into squadrons called "escadrilles," each of which comprises six machines and pilots. These units are kept up to strength, wastage being made up from reserves, so as to maintain the requisite homogeneity.

But ere the war had been in progress many weeks an official order was issued forbidding the employment of the Blériot, Deperdussin, Nieuport, and R.E.P. monoplanes. Those which received official approval included the Caudron, Henry, and Maurice Farman, Morane-Saulnier, and Voisin machines.

This drastic order came somewhat as a thunderbolt, and the reason for the decree has not been satisfactorily revealed. Suffice to say that in one stroke the numerical strength of the French aerial navy was reduced very appreciably; in fact by no fewer than 558 aeroplanes. But each of the four types retained has its own special function; and in numbers each has, no doubt, been greatly augmented. There is only one type of monoplane among the four —the Morane-Saulnier.

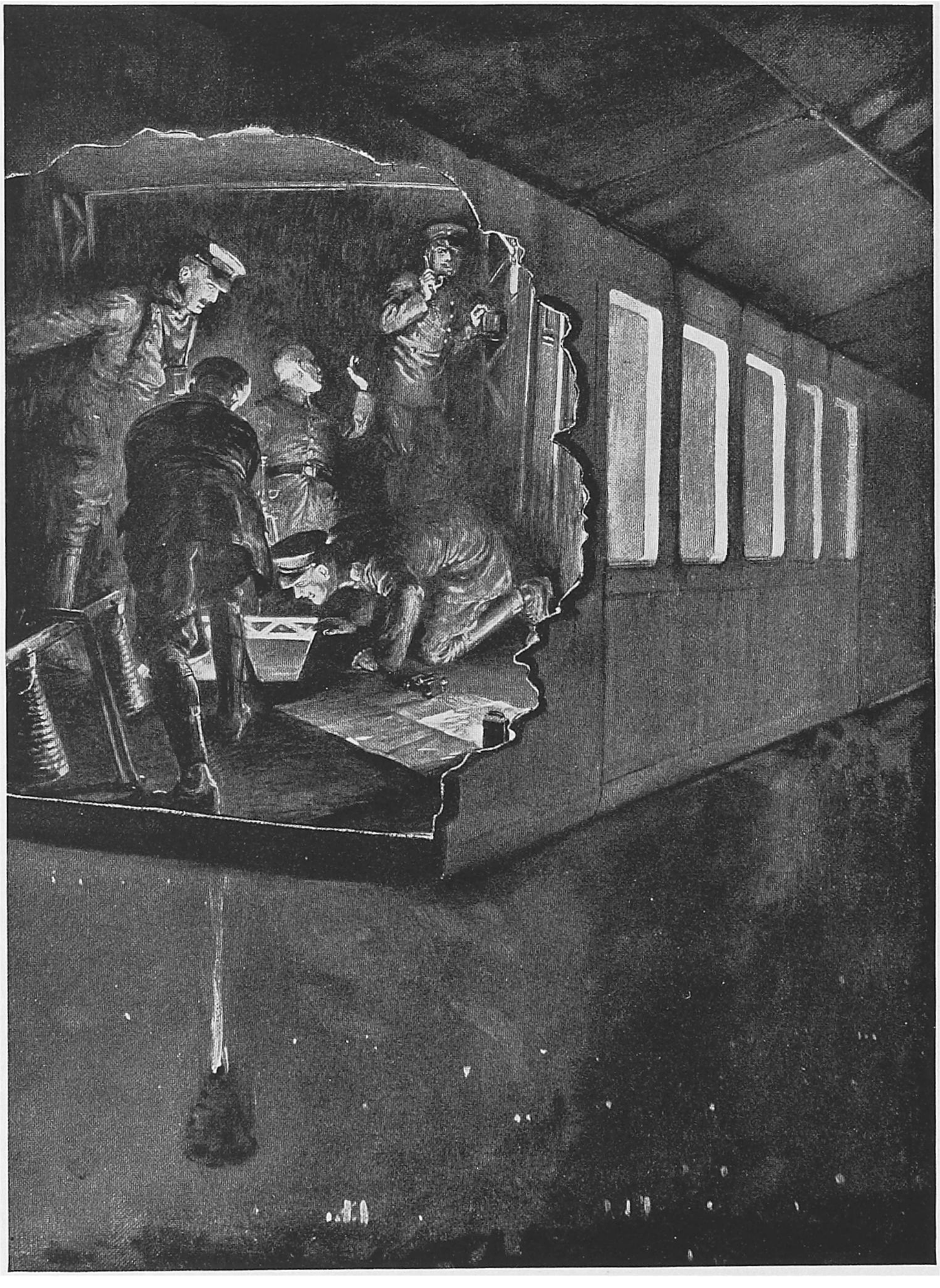
This machine, however, has a great turn of speed, and it is the French mosquito craft of the air. Like the insect, it is avowedly aggressive. Its duties are chasing and bringing down the enemy, for which work its high manœuvring capacity is excellently adapted. Its aggressive armament comprises a mitrailleuse.

As far as biplanes are concerned the Caudron is the fastest in flight and is likewise extremely quick in manœuvring, It supplements the Morane-Saulnier monoplane in the specific duty of the latter, while it is also employed for discovering the enemy's artillery and communicating the range of the latter to the French and British artillery. In this latter work it has played a very prominent part and to it is due in no small measure that deadly accuracy of the artillery of the Allies which has now become so famous. This applies especially to those tactics, where the field artillery dashes up to a position, discharges a number of rounds in rapid succession, or indulges in rafale firing, and then, limbering up, rushes away before the enemy can reply.

The Farman biplanes possess high endurance qualities. They can remain aloft for many hours at a stretch and are remarkably reliable. Owing to these qualities they are utilised for prolonged and searching reconnoitring duties such as strategical reconnaissances as distinct from the hurried and tactical reconnaissances carried out by fleeter machines.

The French aerial fleet has been particularly active in its work of raiding hostile positions and submitting them to a fusillade of bombs from the clouds. The machine which is allotted this specific task is the Voisin biplane. This is due to the fact that this machine is able to carry a great weight. It was speedily discovered that in bomb-raids it is essential for an aeroplane to be able to carry a somewhat large supply of missiles, owing to the high percentage of misses which attends these operations. A raid by a machine capable of carrying only, say, half-a-dozen projectiles, is virtually a waste of fuel, and the endurance limitations of the fast machines reacts against their profitable use in this work. On the other hand, the fact that the Voisin machine is able to carry a large supply of bombs renders it an ideal craft for this purpose; hence the official decision to confine it to this work.

Although an aeroplane is an aeroplane, there is considerable difference of method in the flying of the Germans and the Allies. One German practice is to proceed alone upon long flights over the enemy's lines, penetrating just as far into hostle territory as the pilot considers advisable. It is a kind of roving commission without any definite aim in view beyond the collection of general intelligence. This work, while productive and valuable to a certain degree, is attended with grave danger, as the German airmen have repeatedly found to their cost. German airmen who essayed journeys of discovery in this manner, often failed to regain their lines because they ventured too far.



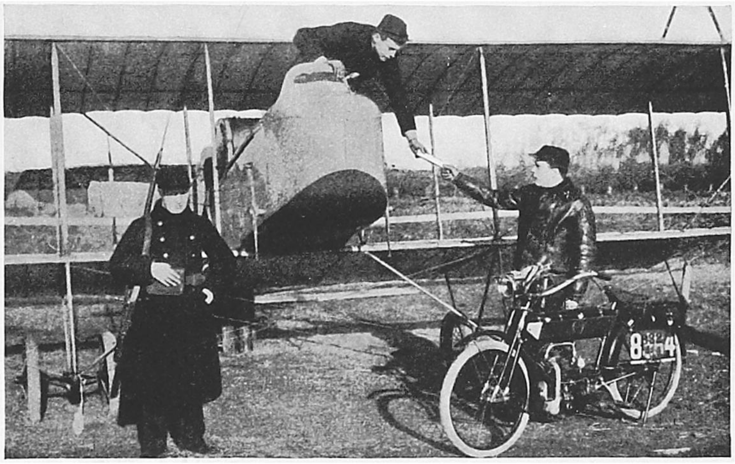
Interior of the Bomb-Dropping Cabin of an Airship

The roving Teuton scout was considerably in evidence in the early days of the war, but experience emphasised the fact that, in aerial strategy, a roving commission is a mistake.

The methods of the British airmen are in vivid contrast to the practice of the venturesome Teuton aerial rovers described above. While individual flights are undertaken they are not of unknown duration or mileage. The man is given a definite duty to perform and he ascends merely to fulfill it, returning with the information at the earliest possible moment. It is aerial scouting with a method. The intelligence is required and obtained for a specific purpose, to govern a contemplated move in the grim game of war.

The French flying men work upon broadly similar lines. Their fleet is divided into small squadrons each numbering four, six or more machines, according to the nature of the contemplated task. Each airman is given an area of territory which is to be reconnoitred thoroughly. In this way perhaps one hundred or more miles of the enemy's front are searched for information at one and the same time. The units of the squadron start out, each taking the appointed direction according to the preconceived plan, and each steering by the aid of a compass and map. They are urged to complete the work with all speed and to return to a secret rendezvous.

The ordeals to which aeroplanes are submitted in military duties are far more severe than any imposed by the conditions of commerce or exhibition. Accordingly there is every indication that the war will represent a distinctive epoch in aeroplane design and construction. Many problems still await solution, such as the capacity to hover over a position, and it is quite possible that these complex and baffling questions will be settled definitely as the result of operations in the field.



Aviator Handing Results of a Reconnoissance to a Motor Despatch-Rider